Massachusetts Health Care Cost Trends
Part I: The Massachusetts Health Care System in Context: Costs, Structure, and Methods Used by Private Insurers to Pay Providers

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February 2010

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Acknowledgements: Deborah Chollet and Allison Barrett of Mathematica Policy Research, Inc.; Saleema Moore of Brandeis University; and Steven Kappel of Policy Integrity, LLC.

Executive Summary

The Massachusetts health care system is a critical component of the state's economy. Health care is the state's top industry, the largest employer of Massachusetts residents, and accounts for over 13 percent of its $365 billion Gross State Product (GSP). The Commonwealth Fund ranks Massachusetts first in terms of access to care and seventh overall among states on its *State Scorecard*, which measures health system performance. Massachusetts hospitals are often cited as among the best in the nation in terms of the quality of health care services provided, scoring higher than national average on treatment of major conditions. Furthermore, Massachusetts health insurers are consistently rated among the top ten best plans in each category nationwide.

At the same time, Massachusetts is grappling with escalating health care costs, which are consuming a greater portion of the economy and lowering real wage growth. Some of the cost growth is driven by system-wide challenges, such as an aging population and the greater use and availability of increasingly complex levels of medical care, much of which can be uncoordinated. To that point, Massachusetts ranks in the lowest quartile of states for avoidable hospital use and costs on the *Commonwealth Fund State Scorecard*. However, some challenges, such as those that stem from the structure of the health care market place, are unique to Massachusetts and must be considered when identifying strategies to mitigate health care cost growth.

About this Report

This report examines the factors that contribute to high health care costs in Massachusetts, including the structure of the health care system and the payment methods currently used by Massachusetts health insurers. Understanding these factors will better prepare the Commonwealth to evaluate and develop reforms that have the potential to simultaneously contain cost growth and improve quality.

Data describing the Massachusetts health care system are drawn from various published sources. Data on payment methods are based on the results of a 2009 questionnaire administered for the Division of Health Care Finance and Policy, in which Massachusetts insurers documented the ways in which they pay hospitals, physicians, and intermediary organizations (medical groups, Independent Practice Associations [IPAs] and physician-hospital organizations [PHOs]).

Summary of Key Points

The data presented in this report suggest that the Massachusetts health care system has several unique characteristics that make it different from the rest of the country, some of which may contribute to its high health care costs:

1. A health care system with many highly specialized medical personnel and the strong presence of academic medical centers.

2. The greater availability and use of more academic medical centers for both inpatient and outpatient hospital-based services. Moreover, market consolidation and concentration has allowed certain providers to leverage and receive higher payments from insured patients.
3. The dominance of fee-for-service payment methods, which do not provide incentives to coordinate care or deliver services in more cost-effective, appropriate settings.
4. Richer insurance benefit packages than in other parts of the country.

Health Spending Trends

Personal health spending per capita is higher in Massachusetts relative to the nation, but growth in spending has followed a trend similar to that of the U.S. (see Figure 1). In 2004, health spending per capita in Massachusetts was 27 percent higher than the U.S. average ($6,683 versus $5,283). After adjusting for non-patient revenues (such as federal grants and investment income) and regional wage differences, personal health spending in Massachusetts is 15 percent higher than the national average. In particular, adjusted per capita spending on home health and nursing home services is considerably higher in Massachusetts than in the U.S.

Overview of the Massachusetts Health Care System

The Massachusetts health care system is characterized by a high number of highly specialized medical personnel and the strong presence of academic medical centers. Massachusetts has the highest physician to population ratio in the nation and a higher proportion of specialists than in any other state even after controlling for interns, residents, fellows, and researchers. In 2006, about 46 percent of licensed hospital beds in Massachusetts were in academic medical centers, compared to 19 percent nationally. Massachusetts has more than twice as many medical residents per capita compared to the U.S. average, with 90 percent of these residents located in hospitals in the greater Boston area.

A large proportion of services in Massachusetts are provided in academic medical settings. The influence of academic medicine continues to expand throughout Massachusetts as Boston academic medical centers build outpatient facilities in the suburbs. Greater inpatient and outpatient use in academic medical centers has implications for health care costs, as academic medical centers charge higher prices relative to community hospitals.

Academic medical centers contribute significantly to the state economy. In 2007, per capita economic activity contributed by academic medicine in Massachusetts totaled $4,522. Furthermore, Massachusetts receives more NIH funding per capita than the rest of the U.S.—at nearly $350 per capita compared to less than $70 per capita nationally—in large part through the research activities of academic medical centers.

Massachusetts has a higher health maintenance organization (HMO) penetration rate than the U.S. (33 percent compared to 23 percent nationally), but the prevalence of traditional closed (or selective) provider network HMOs is diminishing. There has been a national movement away from capitation in the past decade, and HMOs in Massachusetts are not required to offer selected provider networks or share financial risk with providers. Moreover, the market share of preferred provider organizations (PPOs) in Massachusetts increased from 32 percent in 2003 to 59 percent in 2007, similar to the 2007 U.S. average of 61 percent.

Methods Used by Health Insurers to Pay Providers in Massachusetts

A 2009 survey conducted for the Division of Health Care Finance and Policy offers insight into the methods used by health insurers to pay providers in their private HMO, PPO, and public (Medicare and Medicaid) products. The survey of 13 health insurers in Massachusetts indicates that:

- Fee-for-service payment methods, which offer few incentives to reduce the volume of unnecessary or inappropriate services, are the dominant method of payment in all types of plans. PPOs, which represent the majority of commercial members, reported no capitation payments (payments made per member rather than per service). HMOs used capitation to pay a small proportion of primary care providers (PCPs) and specialists - 16 percent and 5 percent, respectively.
- On average, capitation payments were used to pay a higher percentage of PCPs in the largest Medicare and Medicaid products (33 percent and 35 percent respectively) than in the largest commercial HMO products (16 percent).
- Diagnosis-related groups (DRG) and per diem payments were the most common form of payment for inpatient hospital services and reward high utilization, not outcomes. For outpatient hospital services, little financial risk was shifted to providers: discounted charges, payment per case, and payment per visit were the most common payment methods.
- Nearly half of all HMOs and half of all insurers share financial risk with one or more medical groups through contracts, meaning that they pay these provider groups based on groups of services, or on a per person basis (capitation) or pay them using fee-for-service alongside other types of incentives to keep costs under control. These types of risk contracts can, if applied to a sufficient share of payments, create incentives to reduce the volume of unnecessary services provided and enhance coordination of care.

Introduction

The Massachusetts health care system is a critical component of the state's economy and factor in the vitality of its communities. Health care is the state's top industry, the largest employer of Massachusetts residents, and accounts for over 13 percent of its $365 billion Gross State Product (GSP). The Commonwealth Fund ranks Massachusetts first in terms of access and seventh overall among states on its *State Scorecard*, which measures health system performance. According to the Hospital Compare website, Massachusetts hospitals score higher than national average on treatment of major chronic diseases and hospital infections.[2] Based on the member satisfaction, prevention, and treatment measures established by the National Committee for Quality Assurance, several commercial plans, Medicare plans, and Medicaid plans based in Massachusetts were consistently rated among the top ten best plans in each category nationwide.[3]

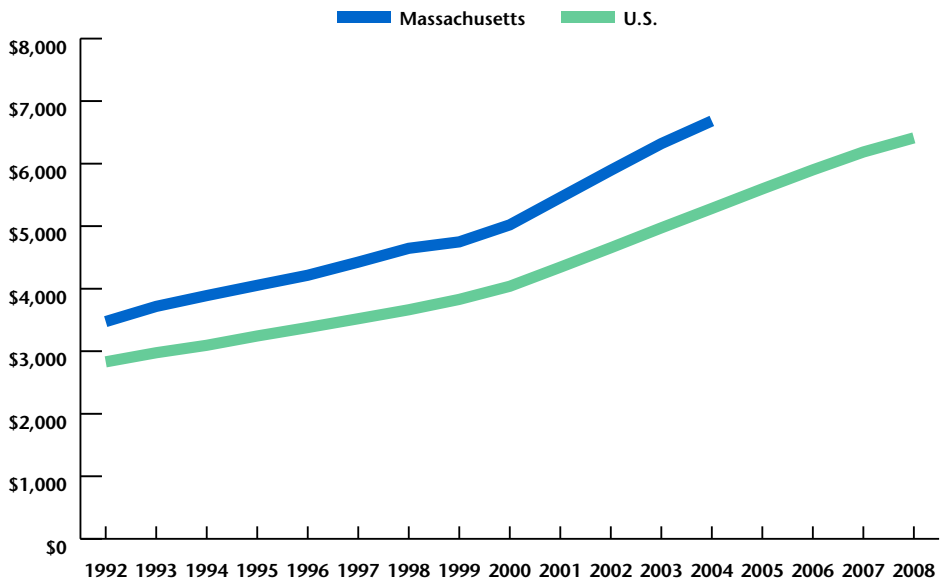
At the same time, Massachusetts is grappling with escalating health care costs which are consuming a greater portion of the economy and lowering real wage growth. Some of the cost growth is driven by system-wide challenges, such as an aging population and the greater use and availability of increasingly complex levels of care. Massachusetts ranks in the lowest quartile of states for avoidable hospital use and costs on the *Commonwealth Fund State Scorecard*. Some challenges, such as those that stem from the structure of the health care market place, are unique to Massachusetts and must be considered when identifying strategies to mitigate health care cost growth.

Massachusetts Health Spending Trends Compared to the Nation

Massachusetts Per Capita Health Spending Compared to the Nation

Historically, per capita health spending has been higher in Massachusetts relative to the nation, but has grown at a rate similar to that of the U.S. From 1992 to 2008, per capita health spending in the U.S. more than doubled, growing from $2,830 to $6,411, or 5.5 percent annually (Figure 1). The difference between Massachusetts and the U.S. increased from 22 percent in 1992 to 27 percent in 2004, likely due to broader insurance coverage and more generous benefits in Massachusetts compared to the nation, but could also point to underlying delivery system structures which have promoted greater cost growth in Massachusetts than elsewhere.[4,5] Comprehensive health spending estimates at the state level including Massachusetts are available only through 2004.

Figure 1: Massachusetts Historically Has Had Higher Per Capita Personal Health Spending than the U.S.



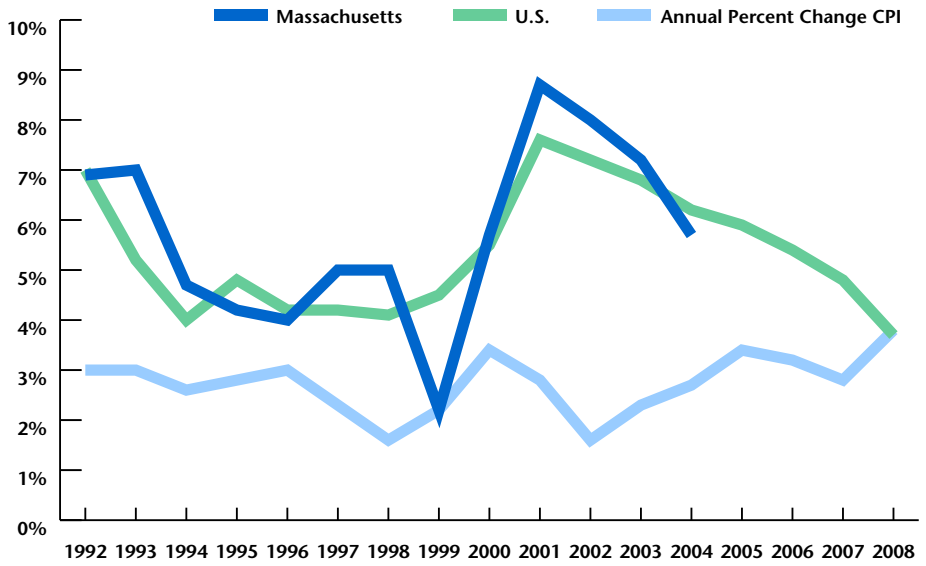
Source: Centers for Medicare & Medicaid Services (CMS), Office of the Actuary, National Health Statistics Group. (http://www.cms.hhs.gov/NationalHealthExpendData/downloads/tables.pdf).
Note: Massachusetts rates provided by CMS are available only through 2004.

Annual Growth in Per Capita Health Spending Compared to the Nation

Personal health spending growth rates have varied over time for both Massachusetts and the U.S., with trends declining since 2002 toward lower rates of growth (Figure 2). In 2008, growth in per

capita personal health spending for the nation decreased to 3.7 percent. Nationally, the increase in health care spending over time has been associated with: greater use and availability of health care personnel and high cost medical facilities; increasingly complex levels of resource use; fragmented health care organization and payment which can lead to provision of unnecessary services; and the prices that these services can command in the market place.[6,7,8]

Figure 2: Annual Growth in Per Capita Personal Health Spending for the U.S. and Massachusetts Follows Similar Trends



Note: Data on annual growth in per capita health spending is currently unavailable for Massachusetts after 2004.
Sources: Centers for Medicare & Medicaid Services (CMS), Office of the Actuary, National Health Statistics Group, 2007; U.S. Bureau of Labor Statistics.

Trends in health spending growth over time have been similar for Massachusetts and the U.S., and can be explained in part by the same factors that have contributed to U.S. spending growth:

- In the 1970s and 1980s, thirty states (including Massachusetts) had hospital rate-setting systems. Many states ended their rate setting programs in the early 1990s. Massachusetts' rate-setting system allowed health maintenance organizations (HMOs) unlimited discounts on hospital admissions. In 1991, when the presence of HMOs in the state market was significant as well as their level of discount, a decision was made not to treat HMOs similarly to other plans but rather to discontinue rate regulation.[9]
- The success of HMOs in the early 1990s, with their emphasis on restricted networks, utilization management, and provider risk sharing, led to decreased hospitalizations and slower health spending growth between 1992 and 1999.[10] Massachusetts mirrored the national trend but its health care costs grew faster between 1992 and 1995.

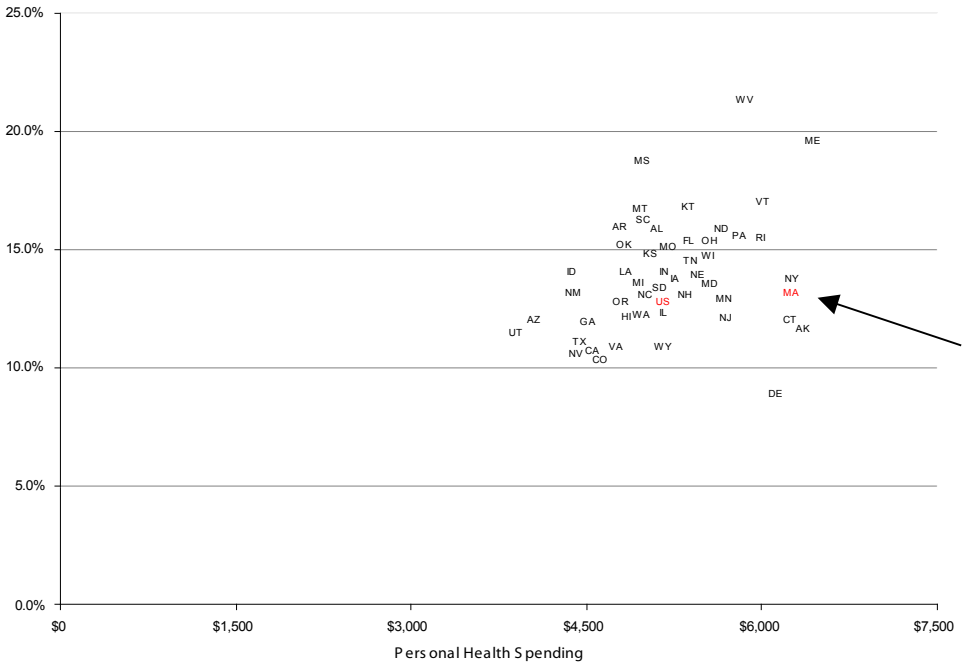
- Beginning in the late 1990s, enrollment in preferred provider organizations (PPOs) increased as the public, employers, insurers, and physicians reacted against the "gatekeeping," utilization review, capitation, physician panels, and smaller payment increases that became synonymous with HMOs.[11] PPOs' emphasis on open, less restrictive networks and fee-for-service (FFS) payments generated substantially higher growth in spending.[12,13] After experiencing its lowest growth rate in 1999, Massachusetts health care spending grew faster than the national average for most of the next five years.

Some studies at the national level suggest that hospital consolidation in the 1990s helped to fuel the growth in hospital prices in recent years.[14, 15, 16] Hospital consolidation may increase hospital market power, enabling hospitals to charge higher prices.[17] Furthermore, the level of competition in the market is reduced following each given merger because there are fewer competing entities, enabling both merging and non-merging hospitals to raise their prices.[18] Both nationally and in Massachusetts, hospital rate regulation, effective in holding down rates in the 1980's, was dropped in favor of managed care, which was credited with reducing the rate of overall expenditures increases. The short-term success of managed care was linked directly to its ability to develop greater efficiencies in service use and to obtain lower prices from hospitals because of excess bed capacity. However, as the health care system adjusted to these market forces over time, providers became more powerful through consolidation, thereby reducing the level of competition by shrinking the number of competing entities.[19,20]

Massachusetts Health Spending as Percent of GSP Compared to Other States

In comparing Massachusetts to other states on per capita health spending as a percent of Gross State Product (GSP), the Commonwealth ranks near the middle at 13.3 percent (Figure 3).[21] Therefore, although Massachusetts has higher per capita spending, the economy also generates more income leading to higher average earnings among Massachusetts residents compared with many other states.

Figure 3: Personal Health Care Spending as a Percent of Gross State Prodict (GSP)

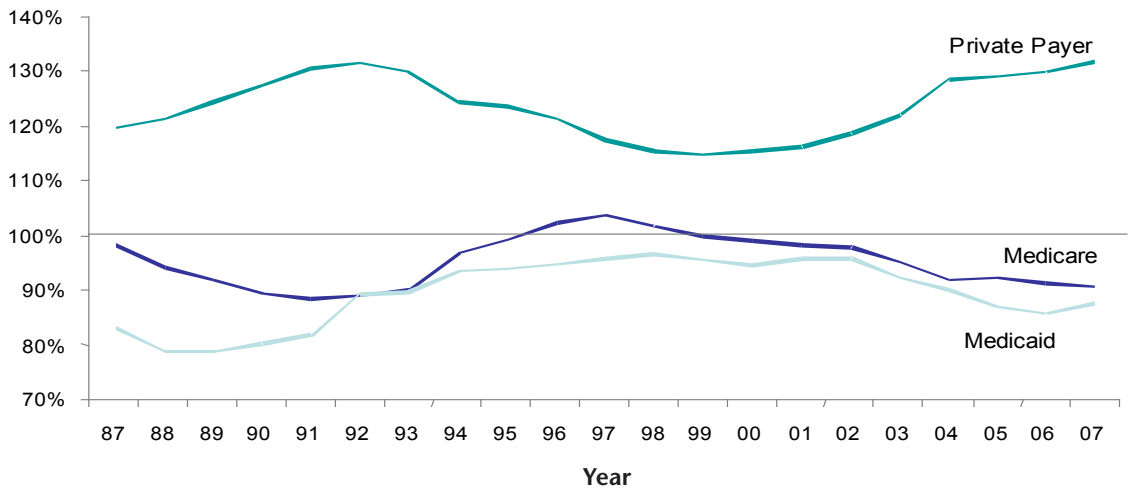


Source: CMS Health Expenditures by state of residence, 2004 http://www.cms.hhs.gov/NationalHealthExpendData/downloads/res-us.pdf.
Per capita personal health spending net of non-patient revenue.

Health Care Prices

Higher rates paid to providers have contributed to the growth in total U.S. health care spending.[22,23] However, public and private insurers have experienced different price trends. Medicare and Medicaid have limited their own price increases since 1998, the first year of the Balanced Budget Act. Since that time, private payers have paid higher prices in relation to public payers.[24,25] Nationally, in 2007, private payers paid hospitals 132 percent of their costs on average, up from 115 percent in 2000 (Figure 4). In contrast, Medicare paid hospitals slightly above 90 percent of their costs in 2007, down from approximately 98 percent of their costs in 2000.[26] Comparable estimates for hospitals in Massachusetts are not available. The ability of hospitals to negotiate higher payments varies widely. Certain hospitals, particularly those with more financial resources and market power, are able to demand higher rates from private insurers.[27]

Figure 4: U.S. Hospitals Shift Costs to Private Payers, 1987-2007
Percent of Hospital Costs that Are Paid



Note: Medicaid payments include Medicaid Disproportionate Share payments.
Source: Avalere Health analysis of American Hospital Association Annual Survey data, 2007, for community hospitals in AHA Chartbook: Trends affecting hospitals and health systems, 2009.

Massachusetts Health Care Spending by Type of Service Compared to the Nation

To understand how the cost of patient care compares between markets and regions, it is necessary to adjust for differences in non-patient revenue reported by hospitals (such as research grants and investment income) and local health care wages, both of which are much higher in Massachusetts than the national average. For instance, Massachusetts hospitals received between two to three times as much non-patient revenue in 2004 than the U.S. hospital industry average.[28] After adjusting for non-patient revenues and regional wage differences, Massachusetts health spending was 15 percent higher than the U.S. average in 2004, considerably less than the 27 percent difference prior to these adjustments (see Appendix for adjustment methodology).

As shown in Table A, for certain medical services, Massachusetts spending is higher than the U.S. average, including: hospital care (both inpatient and outpatient facilities), dental, home health, prescription drugs, and nursing home care. In particular, Massachusetts has significantly higher per capita spending on home health and nursing home care services.

Table A: Per Capita Personal Health Spending in Massachusetts is Higher than the U.S., even after Adjusting for Differences in Non-Patient Revenue and Geographic Wage Index, 2004

	Unadjusted			Adjusted for Non-Patient Revenue [a]			Adjusted for Non-Patient Revenue & Wage Index [b]		
	MA	US	Difference	MA	US	Difference	MA	US	Difference
Total	$6,683	$5,283	26.5%	$6,430	$5,245	22.6%	$6,025	$5,243	14.9%
Hospital	$2,620	$1,931	35.7%	$2,367	$1,894	25.0%	$2,242	$1,892	18.5%
Physician	$1,416	$1,341	5.6%	$1,416	$1,341	5.6%	$1,264	$1,341	-5.7%
Other Professional	$200	$179	11.7%	$200	$179	11.7%	$179	$179	-0.3%
Dental	$354	$277	27.8%	$354	$277	27.8%	$316	$277	14.1%
Home Health	$271	$145	86.9%	$271	$145	86.9%	$250	$145	72.4%
Drugs	$849	$757	12.2%	$849	$757	12.2%	$849	$757	12.2%
Durable Medical Equipment (DME)	$78	$79	-1.3%	$78	$79	-1.3%	$78	$79	-1.3%
Nursing Home	$641	$392	63.5%	$641	$392	63.5%	$594	$392	51.6%
Other	$254	$181	40.3%	$254	$181	40.3%	$254	$181	30.3%

Notes:
a Non-patient revenue includes research grants, investment income, and other non-patient revenue sources.
b Based on Medicare geographic wage index and Geographic Adjustment Factor (GAF) applied to labor portion of spending by category
c Other professional services include services provided in facilities operated by medical providers other than physicians and dentists such as private-duty nurses, chiropractors, podiatrists, optometrists, and physical, occupational and speech therapists.
d Other personal health care services include: medical care provided to employees at work sites; medical care provided in non-traditional provider sites such as schools, military sites, and community centers; and home and community-based services through Medicaid.
Source: National Health Expenditure Accounts, Centers for Medicare and Medicaid Services, 2004.

Greater Long-Term Care Spending Per Capita in Massachusetts

Home health and nursing home care services in Massachusetts generate much higher spending than the national average. Adjusted per capita spending on home health care services in Massachusetts is 72.4 percent higher than the U.S. and adjusted per capita spending on nursing home services in Massachusetts is 51.6 percent higher than the U.S. average. The higher spending on long-term care services is due partly to higher utilization and partly to payment levels that are higher than national average. However, Massachusetts citizens are only slightly older than residents of other states. Its residents' median age is 1.8 years higher than that of the US median age. In Massachusetts, 13.3% of the population is 65 years old or older and 2.2% of the population is 85 years or older, as compared to 12.6% and 1.8%, for the US, respectively. [29]

In 2007, Massachusetts had nearly 25 percent higher nursing home utilization than the nation. There were 320 nursing home residents per 1,000 population who were 85 years and older in Massachusetts compared to 259 per 1,000 in the U.S.[30] In addition, use of Medicare home health services by Massachusetts residents was among the highest in the country in 2001, with 57 users per 1,000 population in Massachusetts, fifty percent higher than the national average of 38 users per 1,000 population.[31]

In Massachusetts, like the rest of the U.S., the majority of nursing home care and home health services are funded by Medicaid. Relative to the U.S. average, Massachusetts offers more generous

long-term care benefits through its Medicaid program, MassHealth. The MassHealth program has implemented significant efforts to expand the availability and use of community based services.[32] While nursing home utilization in Massachusetts has decreased in recent years, spending has continued to increase due to mandated payment rate increases over time. In 2008, Massachusetts had the seventh highest Medicaid nursing home expenditures per capita at $249.96, significantly higher than the U.S. average of $161.23.[33] In 2007, MassHealth nursing home rates were 23 percent higher than the national average.[34]

Greater Hospital Spending Per Capita in Massachusetts

The 18.5 percent difference in hospital spending in Massachusetts compared to the U.S. reflects, in part, higher hospital use, particularly outpatient and emergency department use (see Table B).

Table B: Hospital Use in Massachusetts Is Higher than U.S. Average, Particularly Outpatient Hospital Care, 2007

	Utilization per 1,000 population		
	Massachusetts	U.S.	MA/U.S. difference
Inpatient			
Beds	2.5	2.7	-7.40%
Inpatient days	688.5	657.3	4.70%
Admissions	129.7	118.4	9.50%
Average length of stay	5.3	5.6	-5.4
Outpatient			
Emergency dept visits	487.7	396.2	23.10%
Other hospital outpatient visits	2,548.40	1,610.60	58.20%

Note: These data include hospital admissions from out-of-state residents, so actual utilization rates limited to Massachusetts residents may be between 2 and 5 percent lower than those shown. These data represents hospital-based care only, and does not include the proportion of outpatient care that is provided in physician offices and other non-hospital outpatient settings. Comparative data is not available for use of non-hospital outpatient care.
Source: AHA Annual Survey[35]

Massachusetts residents use inpatient hospital care at a slightly higher rate than the U.S. average. However, use of hospital outpatient services in Massachusetts is nearly 60 percent higher than the U.S. average, and use of emergency departments is 23 percent higher. The higher use of both inpatient and outpatient hospital services in Massachusetts suggests that less expensive outpatient services may not be replacing more expensive inpatient care, but instead may reflect higher overall use of services.

One of the widely-accepted drivers of health care spending growth is technology—the development and spread of new diagnostic and treatment modalities. In 1995, Massachusetts was 40 percent below the national average for MRI units per million residents. By 2008, it is estimated that the state

had reached the national average.[36] Overall, in 2005, Massachusetts was the third highest state in percentage of hospitals offering many of the most commonly used high-tech services.[37]

According to a recent General Accounting Office (GAO) report, while Massachusetts Medicare physician services per population are higher than average for the U.S., no medical service area in Massachusetts was considered a "potentially overserved" area in terms of physician service utilization.[38] Moreover, when Medicare data are used to compare similar benefits across market areas, Boston Medicare beneficiaries do not use more health care services than those in other large cities. After adjusting for regional differences in wages, health status, special Medicare payments to hospitals and physicians, and regional differences in Part A and Part B enrollment rates, Boston service use per Medicare member is close to the U.S. average,[39] suggesting that patterns of care for the Medicare population are similar to the nation as a whole.

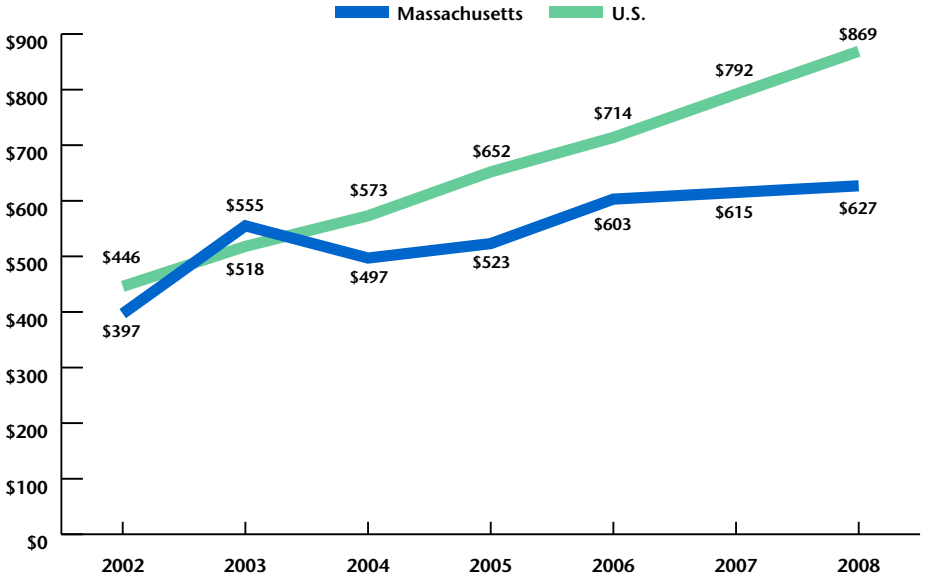
Insurance Coverage

Massachusetts has the highest insurance rate in the country, with over 97 percent of residents covered compared to a national average of 85 percent.[40,41] Massachusetts is known for its commitment to broad health care coverage for its population, dedication of significant state revenue to subsidized coverage, a strong network of consumer advocates, and an extensive federal Medicaid 1115 waiver.[42,43] The widespread availability of health insurance improves access to care, increases use of health care services, and makes patients less sensitive to the price of care.[44] Having comprehensive insurance coverage that buffers the individual from the cost of a given health care service discourages members from considering cost-effectiveness when seeking services and choosing providers. This is likely to have an upward-pushing effect on total medical spending.

A greater proportion of Massachusetts residents are enrolled in health plans with more generous benefits than the national average.[45,46] As part of Massachusetts health reform, Massachusetts residents are required to have health insurance that meets criteria for "minimum creditable coverage" (MCC). Furthermore, while the proportion of U.S. residents who are underinsured has increased in recent years, the trend has moved in the opposite direction for Massachusetts. A recent study of underinsurance in Massachusetts, as measured by the level of out-of-pocket health care expenses, suggests that in 2007, among adults who were insured for the full year, the rate of underinsurance in Massachusetts was 6.1 percent compared to 19.8 percent in the U.S.[47]

The average individual deductible is an additional indicator of insurance benefit generosity. Between 2002 and 2008, the average individual deductible for employer-sponsored insurance in Massachusetts increased more slowly than the U.S. average (Figure 5). By 2008, individuals in Massachusetts, on average, faced 28 percent lower deductibles than the U.S. average. Typically, more generous benefits and less cost-sharing are associated with higher overall health spending due to increased use of health care services.[48]

Figure 5: The Average Individual Deductible in Employer-Sponsored Plans in Massachusetts Has Risen More Slowly than in the U.S., 2002-2008



Source: Agency for Healthcare Research and Quality, Center for Financing, Access and Cost Trends. Data for 2008 are estimated.

The Structure of the Massachusetts Health Care System: Health Care Resources, Academic Medicine, and the Insurance Market

The Massachusetts health care system is characterized by a higher proportion per capita of physicians and other health care personnel. The state also experiences greater use of academic medical centers, which provide a significant percentage of inpatient and outpatient hospital-based care.

Health Care Workforce

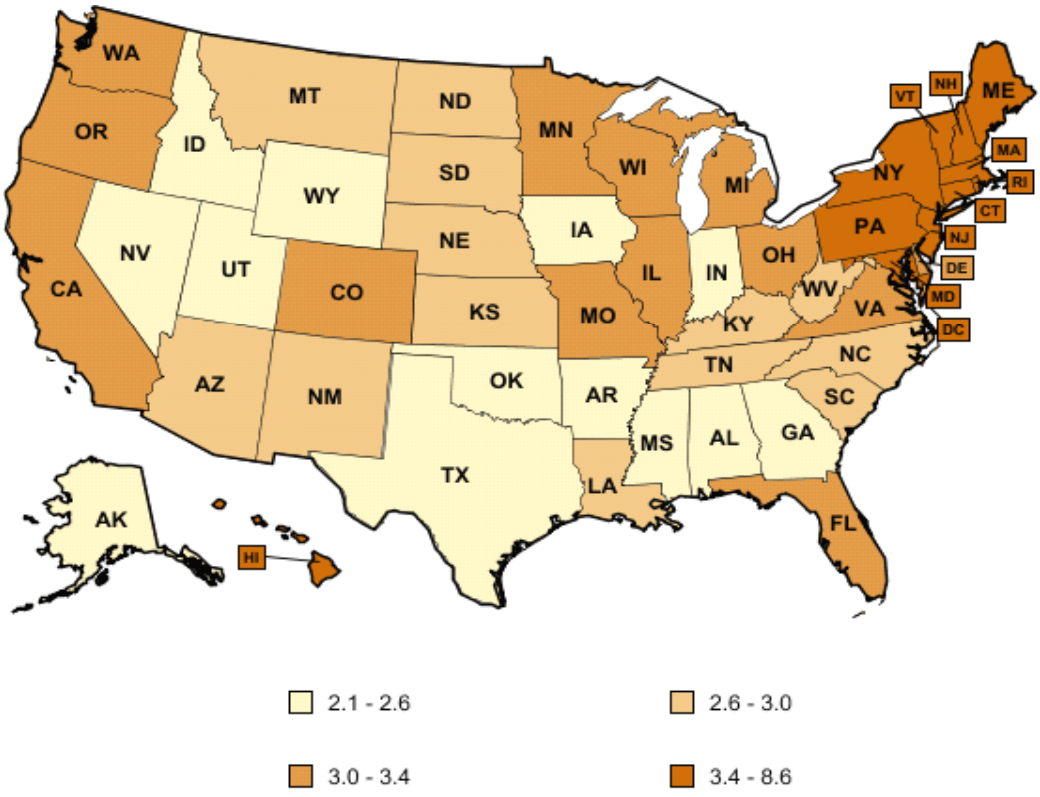
Massachusetts has the highest ratio of physicians to population in the nation, and higher ratios of other health personnel than the U.S. average (Figure 6 and Table C). However, actual differences between Massachusetts and the U.S. may be lower since a relatively high percentage of Massachusetts physicians may only provide patient care part-time while primarily participating in teaching and research.

Table C: Massachusetts Has More Health Personnel per Capita than the U.S. Average

	Personnel per 1,000 population		
Workforce personnel	Massachusetts	U.S.	MA/U.S. ratio
Non-federal Physicians [a]	5.28	3.30	1.60
Non-federal PCPs[a]	1.78	1.30	1.40
Non-federal Specialists [d]	3.50	2.00	1.80
Active Physicians[b]	4.28	2.70	1.60
Physicians in Patient Care [b]	3.90	2.53	1.50
Employed RNs[c]	1.18	0.83	1.40
RNs total[a]	1.23	0.84	1.50
Physicians Assistants [a]	0.27	0.24	1.10
Dentists[a]	1.10	0.80	1.40

Sources:
a Kaiser Family Foundation, StateHealthFacts.org, 2008.
b Health US, 2008. The rates shown are based on the year 2006.
c Health Resources and Services Administration. Results from the Health Workforce Survey, 2004.
d Kaiser Family Foundation, StateHealthFacts.org, 2008. Specialist calculations based on the difference between total Non-Federal physicians, and Total Non-federal PCPs.

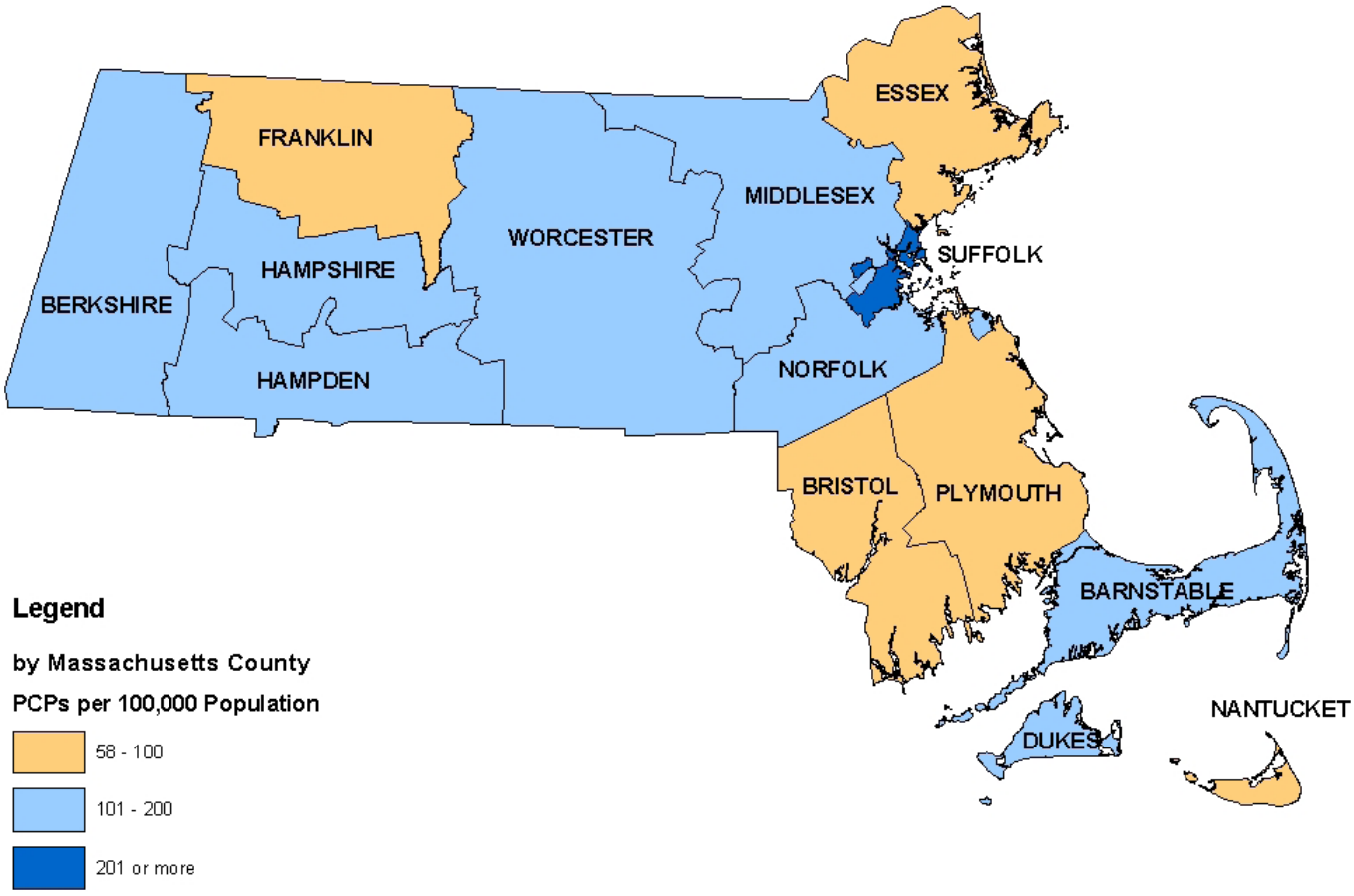
Figure 6: Massachusetts Has a High Concentration of Physicians: Nonfederal Physicians per 1,000 population, 2008



Source: www.statehealthfacts.org

Particularly, the number of specialist physicians per capita in Massachusetts is considerably higher when compared to the U.S. average. Massachusetts has 80 percent more non-federal specialists per capita than the U.S. A slightly smaller proportion of Massachusetts physicians practice primary care than in other states: approximately 34 percent of physicians in Massachusetts are primary care providers, compared to 39 percent nationally.[49] Most of these PCPs practice in the greater Boston area (see Figure 7).

Figure 7: Primary Care Physician Density by County per 100,000 Population, 2006



Source: Health Resources and Services Administration (HRSA). 2006 National Physician Inventory. Data are derived from the 2006 American Medical Association Physician Master File (AMA MF) and includes 20% Centers for Medicare and Medicaid Services (CMS) Medicare Part B and Outpatient claim data.

Physician Affiliations

With the growing number of larger health systems, physicians must decide whether to affiliate with these systems, develop closer ties with smaller community hospitals, or both.[50] There are several advantages to physicians who choose to affiliate with larger health systems, such as access to electronic health records (EHR), streamlined billing systems, access to a wider referral base (particularly for specialists), and the potential for higher physician fee schedules.[51] Hospital systems have been able to increase their market share in part by expanding physician affiliations.[52] As larger hospital systems continue to play a dominant role in the state's health care landscape, it is likely that physicians in Massachusetts are increasingly affiliating with them to be able to reap the financial and operational benefits provided by such an arrangement.

Behavioral Health Providers

Massachusetts has a higher than average workforce in the area of behavioral health. According to state profiles, Massachusetts had 28.8 psychiatrists, 67.3 psychologists, and 236.9 social workers per 100,000 population. In 2000, Massachusetts ranked first among states in psychiatrists per capita, third among states in psychologists per capita, and sixth among states in social workers per capita.[53] Also, as of 2008, only 0.7% of Massachusetts residents were estimated to be living in mental health professional shortage areas—the second lowest percentage in the nation. (Delaware has the lowest rate at 0%; the U.S. estimate is considerably higher at 18.7 percent.) In 2006, Massachusetts ranked 17th out of 50 states in mental health services expenditures per capita by state mental health agencies.[54]

Academic Medicine

Academic medicine has a strong presence in the Massachusetts health care system. In 2006, 46 percent of hospitals beds in Massachusetts were in academic medical centers, compared to 19 percent nationally.[55] As a proportion of all hospital admissions in Massachusetts, admissions to academic medical centers increased from 35 percent in 1993 to 45 percent in 2008, compared to the national average of 19 percent throughout the period. The increase occurred mostly during the 1990s, when a number of community hospitals in Massachusetts closed.[56] Consistent with this trend, a higher proportion of outpatient care in Massachusetts is also delivered in academic medical centers relative to the rest of the U.S.[57]

Research suggests that U.S. academic medical centers tend to provide high quality and more technologically-advanced services relative to community hospitals.[58] At the same time, the prevalence of academic medical centers in Massachusetts contributes to higher health care costs and cost growth in the state through more intensive treatments, more diagnostic services, and higher prices.[59]

Controlling for case mix, prices at academic medical centers are typically higher than community hospitals, attributable in part to the cost of teaching, research, and standby capacity for medically complex patients.[60] Historically, Medicare has made both graduate medical education (GME) and indirect medical education (IME) payments to cover the direct and indirect costs of teaching and research at these facilities. However, private payers may also bear these costs through higher negotiated payment rates with academic medical centers.[61] The higher cost of a Cesarean section delivery serves as an example of this difference. In 2007, the median cost of a Cesarean section delivery in Massachusetts academic medical centers ($6,450) was approximately 14 percent higher than in non-academic medical centers ($5,663).[62]

One measure of the influence of academic medicine is the role played by resident physicians. While the presence of medical residents enhances the capacity of hospitals to provide care, there are costs associated with their supervision and training. In 2005, Massachusetts had more than twice as many medical residents per capita compared to the U.S. average, with 78 medical residents per 100,000

people in the state, compared to 35 medical residents per 100,000 people in the U.S.[63] Furthermore, medical residents make up two-thirds of hospital-based physicians in Massachusetts, and 90 percent of these medical residents are located in the greater Boston area hospitals.[64]

Academic medical centers also account for a large proportion of spending on facility expansions and renovations in Massachusetts. A recent analysis of Determination of Need (DoN) approvals across the state—required when a capital expansion would exceed established expenditure minimums or for the introduction of new and innovative services—suggests that between 2000 and 2008, academic medical centers made up 68 percent of approved spending. Spending by academic medical centers was driven by expansion and renovation projects as they were more likely to add new square footage, while community hospitals were more likely to renovate existing square footage.[65]

The influence of academic medicine continues to expand as some health systems are affiliating with suburban community hospitals. Outpatient hospital facilities affiliated with academic medical centers have also opened in the suburbs.[66] As these providers become more concentrated, this further enhances their ability to negotiate higher prices and increases overall health care costs in the system.

Contribution of Academic Medicine to the State Economy

Academic medicine in Massachusetts contributes significantly to the state economy, in particular through the strong presence of biotechnology firms in the Boston area. However, the funding for research and investments can spur the development and use of new medical findings and the expansion of medical facilities, increasing overall health care costs in the system.[67]

In 2007, the Association of American Medical Colleges (AAMC) estimated the total economic impact of its member medical schools and academic medical centers in 28 large states, based on direct impacts such as salaries, and indirect impacts such as goods and services purchased.[68] In 2007, the per capita economic activity generated by academic medicine in Massachusetts ($4,522) was by far the highest among the 28 states studied, and was about 2.8 times a 28-state average.[69]

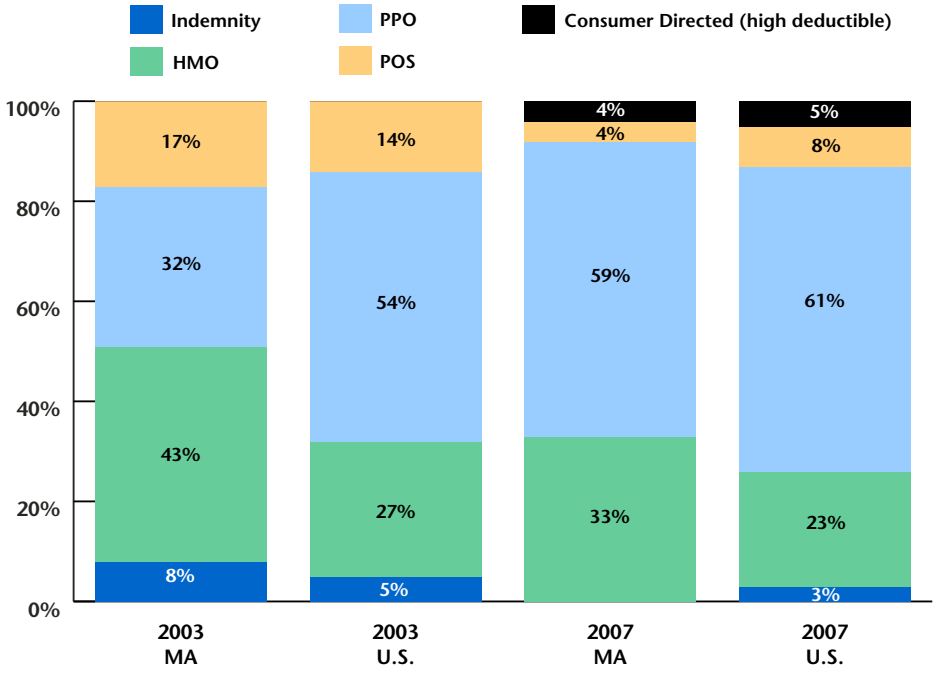
Due to the presence of research and academic medical centers, Massachusetts receives far more National Institutes for Health (NIH) research funding per capita than any other state. In 2008, Massachusetts received $347 in per capita NIH funding in comparison to $68 for the remainder of the U.S.[70] These grants support the state's health care workforce, foster economic and academic productivity, and contribute to the advancement of clinical science through research and technological innovation. According to the NIH Division of Research Grants, the five independent hospitals in the nation that received the most NIH research funding in fiscal 2005 (a combined $883 million) were all located in the city of Boston including: Massachusetts General Hospital; Brigham & Women's Hospital; Beth Israel Deaconess Medical Center; Dana-Farber Cancer Institute; and Children's Hospital Boston.

Structure of the Massachusetts Health Insurance Market

There are several different types of health insurance plans available in Massachusetts. The design of health insurance products has implications for provider payment methods, the extent to which risk for the cost of care is shared with providers, and overall health care costs. Some HMOs use limited networks and provider risk-sharing to control health care costs. In contrast, PPOs, which are less able to contain costs through limited networks, are the fastest growing type of health insurance in Massachusetts and the U.S. In 2007 the HMO penetration rate in Massachusetts was higher than the U.S. at 33 percent versus 23 percent nationally (Figure 8). However, in Massachusetts, the market share of PPOs increased from 32 percent in 2003 to 59 percent in 2007, similar to the 2007 U.S. average of 61 percent.

Since the late 1990s, HMOs nationwide have looked increasingly like PPOs.[71] In Massachusetts, plans labeled HMOs may use the same payment models as PPOs, including fee-for-service. Moreover, they may offer open provider networks and share little or no risk with providers.[72] For example, in Boston, several HMOs have broad provider networks, limited service restrictions, and fee-for-service payment methods.[73] However, while certain HMOs do shift some risk to providers, PPOs currently

Figure 8: Enrollment in Employer-Sponsored Preferred Provider Organization (PPO) Health Plans Is Growing in Both Massachusetts and the U.S., 2003 to 2007



Source: Massachusetts data from: A special analysis of Mercer's national survey of employer-sponsored health plans for the Massachusetts Division of Insurance, 2008. U.S. data from: Mercer's national survey of employer-sponsored health plans, 2007.
Health plan definitions from the Mercer National Survey of Employer-Sponsored Health Plans[74,75]

do not. Since the type of health insurance plan does not necessarily determine how providers are paid, it is essential to look beyond plan labels to understand how performance risk is shifted to providers and the implications of risk-sharing on provider incentives and overall health care costs.

Insurance Market Segments

The market for non-government funded health coverage is divided into three main categories: "fully-insured" employers, "self-insured" employers, and individuals directly purchasing their own coverage. Fully-insured employers purchase insured health coverage from licensed health insurance carriers, whereas self-insured employers bear the financial risk and pay for their employees' and dependents' covered health care expenses from their own resources, but may use a health insurance carrier as an administrator. A large and growing number of employers are self-funding their employee health benefits. In 2009, 51% of private group health coverage enrollment was self-insured groups, up from 45% in 2006.[76] Self-insured employer health coverage is not regulated by the Commonwealth, but rather is dictated by rules and obligations under federal law, specifically the Employee Retirement Income Security Act of 1974 (ERISA) which preempts any state regulation of self-insured health benefit plans. Such plans are not subject to any pricing or coverage regulations under the Massachusetts Division of Insurance (DOI), nor are they subject to state mandates regarding covered benefits. As such, state regulations are only able to influence pricing rules and coverage standards for 49% of employer-sponsored coverage. Recent data indicate that health care costs in the self-insured market are growing more rapidly than those in the fully-insured market. From 2007 to 2008, medical trend for self-insured plans was higher than that for all fully-insured plans, with self-insured experiencing a growth rate of 8.5 percent compared to 7.0 percent for fully-insured employers.[77]

The Massachusetts fully-insured group health insurance market includes the merged small group/nongroup group market (applicable to employers with 50 or fewer covered lives and individuals who purchase their own coverage) and large group market (those with more than 50 covered lives). The merged group market is heavily regulated through premium pricing rules that restrict the amount of variation that can exist between members of different ages and industries, and premiums are built off a base rate that includes the experience of the entire merged group market enrolled with a given health insurer. Large group premium pricing is not regulated in this way, and its premiums are more likely to be experience rated (i.e., premiums for a given year will reflect past years' usage of the employer group's members).

Because current state regulatory authority is only able to affect a portion of the insurance market, health care costs are, by default, more influenced by trends in medical spending than by regulation. For example, health insurers have the power to influence service utilization and selection of care settings through targeted incentives for providers, which can, in turn, affect overall health care spending trends and premium growth rates.

Methods Used by Health Insurers to Pay Providers in Massachusetts

The methods used by health insurers to pay providers are a key factor in health care costs. Incentives influencing the volume, intensity, and quality of care can be implicit in the method of payment. For example, it is widely recognized that fee-for-service payment rewards providers for delivering greater, more costly services, but offers little incentive to improve quality or to offer patient-centered, coordinated care. Other payment methodologies that shift some risk to providers, such as "bundled" payments, reward providers for more efficient delivery of care.

Survey of Payment Methods

This section investigates the methods that health insurers in Massachusetts currently use to pay hospitals, physicians, and post-acute care providers for health care services in their largest health plans. The data request was made in April 2009 and data were provided in June 2009, corresponding to the payment methods used by health insurers at the time data were reported. All health insurers were asked to provide information on forms of payment and payment incentives used in their largest commercial PPO and HMO products.[78] Health insurers that also offer Medicare or Medicaid products were asked to report the same information for those products. Results were obtained from a total of 13 health insurers: 12 of which offered commercial products, and eight of which offered public products (Medicare or Medicaid). When payment methods varied substantially between large and small health insurers, information is reported by size of health insurer for each product type.[79] The survey accounted for the number of health insurers that used a payment method, but not the volume of services paid by each method. Greater detail on the survey and results is provided in *Provider Payment: Trends and Methods in the Massachusetts Health Care System*.

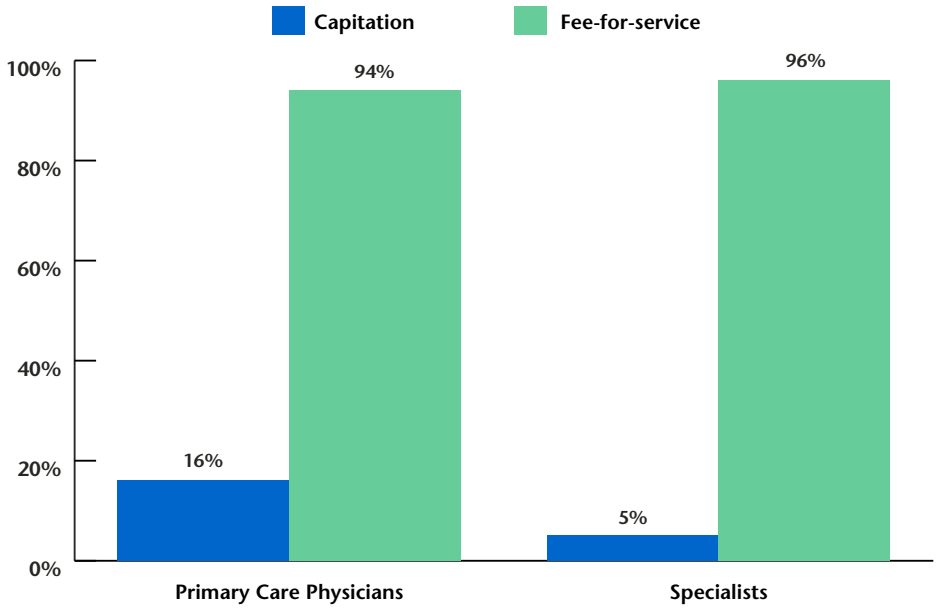
This section focuses on payment methods in HMO products, where risk-sharing or other innovative payment methods are most likely to be used. In Massachusetts, HMOs cover approximately 33 percent of all commercial members, 17 percent of Medicare beneficiaries, and 60 percent of Medicaid beneficiaries.[80] Nearly all other insured residents in the state are covered by commercial PPO products, or traditional, non-network Medicare or Medicaid programs, which rely on FFS payment arrangements. Therefore, the percentage of members who see providers with the risk-based arrangements described here reflects a limited share of the market.

Physician Payment in Commercial Products

Commercial health insurers in Massachusetts reported using FFS as the most common payment method in their largest HMO and PPO products alike, for both primary care and specialist services. In PPO products, FFS was the only method of payment to physicians. In contrast, seven out of the 10 commercial health insurers that offered HMO products used capitation to pay some primary care physicians (PCPs), and half used capitation to pay a small number of specialists. In 2009, health insurers reported using FFS to pay 94 percent of primary care physicians and 96 percent of specialists

in their largest HMO products (Figure 9). This suggests that plan type (PPO vs. HMO) does not distinguish the type of payment method used to pay providers. Furthermore, the predominance of fee-for-service payment methods in the largest PPO and HMO products creates incentives to provide more health care services, regardless of their value.[81]

Figure 9: Fee-for-Service Payments Are the Predominant Mode of Physician Payment by Massachusetts Commercial HMO Products for Health Insurers Using Any Capitation



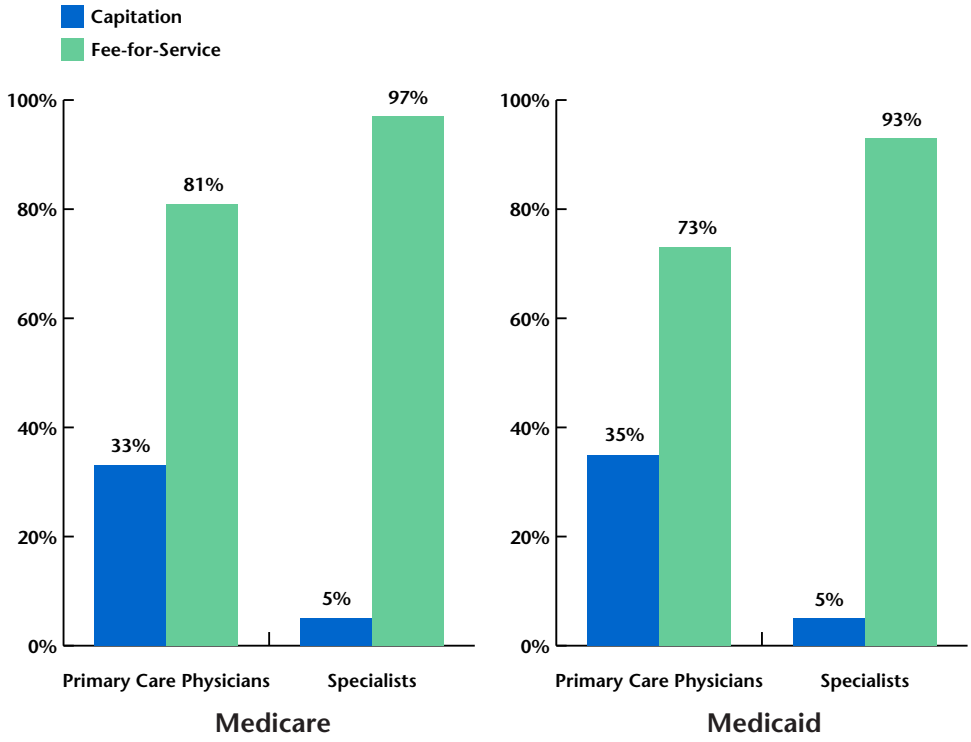
Note: Among the largest commercial products (both HMOs and PPOs), 7 out of 12 commercial health insurers use capitation to pay some PCPs, and 6 out of 12 use capitation to pay a small number of specialists. Each health insurer reported the percent of physicians they pay with each method in the following ranges: 1-9 percent; 10-49 percent; 50-79 percent; 80-99 percent; or 100 percent. The average percent of physicians paid with the method is calculated as the average of the midpoints of the ranges reported by health insurers that used the payment method. Total of payment methods does not add up to 100 percent as physicians may be paid using several methods.
Source: Mathematica Policy Research analysis of a survey of thirteen Massachusetts health insurers conducted for the Division of Health Care Finance and Policy, 2009

Some health insurers used more than one payment method for selected services, so that 16 percent of primary care physicians and 5 percent of specialists were paid capitation in their largest HMO plans. However, most large HMO carriers cover comprehensive services under capitation for at least some PCPs and include in the capitation rates the following services: primary care or other office-based services; ambulatory care provided outside of the office; inpatient visits; ancillary care; and referrals to specialty care. Just over half of the commercial HMO carriers adjusted PCP payments (either FFS or capitation) using performance measures and nearly half of the plans adjust payments based on quality measures as well as utilization or cost measures.

Medicare and Medicaid

Four out of eight health insurers that reported public sector products (Medicare or Medicaid) used capitation for at least some physicians. About one-third of primary care providers (PCPs) in public-sector products were covered under capitation arrangements, much higher than the 16 percent in commercial HMO products (Figure 10).

Figure 10: Capitation is a More Common Payment Method for Primary Care Physicians in Public Sector Products (Medicare and Medicaid) Among Health Insurers Using Any Capitation



Note: Total of payment methods does not add up to 100 percent as physicians may be paid using several methods.
Source: Mathematica Policy Research analysis of a survey of thirteen Massachusetts health insurers conducted for the Division of Health Care Finance and Policy, 2009

Hospital Services

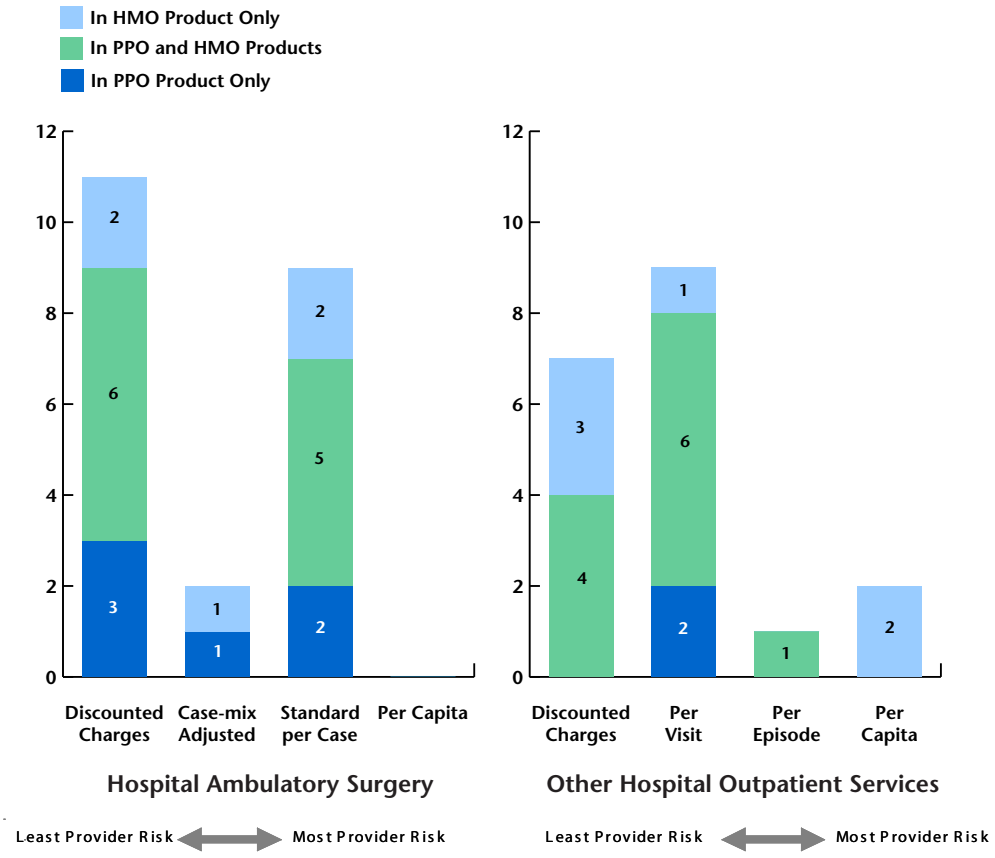
Health insurers use a variety of methods to pay for hospital inpatient and outpatient services, reflecting their different arrangements with hospitals or hospital systems.

For inpatient services, most health insurers used several methods to pay for inpatient services in their largest commercial products (most often diagnosis-related groups (DRGs) [11 out of 12 health insurers] or per diem payments [11 out of 12]). Most health insurers (10 out of 12) paid for at least some hospitalizations with discounted charges in their largest commercial products. Only two

health insurers paid hospitals on a per capita basis in their commercial products (and only for their largest HMO products).

For hospital outpatient services, most health insurers used payment methods that shared little or no risk with hospitals (Figure 11). For hospital outpatient services, most health insurers used a mix of discounted charges and per case (for ambulatory surgery) or per visit (for other outpatient services) payments in their largest commercial products. Such arrangements indicate limited incentives to manage volume in the outpatient setting.

Figure 11: Health Insurers Share Little Risk with Hospitals in Payment Methods for Outpatient Hospital Services in their Largest Commercial PPO and HMO Products, 2009



Note: Case mix adjusted is defined as payments adjusted for patient severity. Standard per case defined as payments for a service, not adjusted for patient severity. Health insurers may use more than one method to pay for services.
Source: Mathematica Policy Research analysis of a survey of thirteen Massachusetts health insurers conducted for the Division of Health Care Finance and Policy, 2009.

Risk Contracts in Commercial and Public Sector Products

Nationally, health insurers sometimes share risk with providers through contracts that are negotiated with intermediate entities such as medical groups, independent practice associations

(IPAs), or physician-hospital organizations (PHOs). These risk contracts may specify capitation, partial capitation, or global budgets for some or all services. Alternatively, they may specify FFS with withholds or bonuses for meeting or approaching use and/or cost targets. None of the Massachusetts health insurers reported using risk contracts in their largest PPO products, and only six of the 10 commercial HMO health insurers reported sharing risk with intermediate entities in their largest HMO products (Table D).

The lack of risk-sharing between health insurers and medical groups, IPAs, and PHOs suggests that these provider organizations receive little financial incentive to focus on preventive medicine and overall medical outcomes through improving the quality of care, increasing coordination of care, or providing care in the appropriate setting.

Table D: Approximately Half of HMO Health Insurers Have Risk Contracts in Public and Private HMO Products

	All HMO Carriers	Large HMO Carriers[1]	All carriers with public products	Largest Medicare product	Largest Medicaid product
Total number of carriers	10	5	8	6	3
Carriers that have risk contracts with medical groups, IPAs, or PHOs	6	4	4	3	2
Number of carriers sharing global risk	6	4	4	3	2
Number of carriers sharing professional risk	3	3	1	1	0
Number of carriers sharing hospital risk	2	2	1	1	0
Among carriers with risk contracts, average percent of providers paid through risk-contracting entities:[2]					
Primary care physicians	8.3%	11.4%	--	22.5%	38.0%
Specialists	4.6%	6.7%	--	16.3%	4.5%
Hospitals	2.0%	3.0%	--	10.8%	0.0%
Among carriers with risk contracts, average percent of:					
Total lives covered under risk-contracting arrangements[2]	19.7%	21.9%	--	64.7%	56.0%
Premiums paid under risk-contracting arrangements[2]	16.8%	18.2%	--	64.5%	55.2%

Note: Each carrier reported risk contracts used by its largest HMO/Medicare/Medicaid plan.
[1] The five carriers with the largest HMO enrollment in December 2008 (including both self- and fully-insured members), representing 90 percent of total HMO enrollment, are included in the "large carriers" category. The remaining five carriers, representing 10 percent of all HMO covered lives, were included in the "small carriers" category.
[2] Percentage of providers, covered lives, and premiums paid through risk-contracting entities are calculated only for carriers and products that reported some risk-sharing. The percentages are calculated by weighting each carrier equally.
Source: Mathematica Policy Research analysis of a survey of thirteen Massachusetts health insurers conducted for the Division of Health Care Finance and Policy, 2009.

- Four out of eight health insurers with public products had risk contracts with intermediate entities.
- Global risk-sharing (risk contracts that included all services including inpatient and outpatient services) is more common than risk contracts covering only physician or only hospital services among private and public product health insurers.

- While most health insurers with large commercial HMO products share risk with intermediate entities, those risk contracts involve relatively few providers or patients.
- Members in health insurers' largest Medicare and Medicaid products were more likely to be covered under risk contracts than members in the largest commercial HMO products.

Innovative Payment Methods

Several payers in Massachusetts and nationally have adopted pay-for-performance (P4P) and other innovative payment models that combine quality or efficiency incentives with their basic method of payment.[82] P4P is an approach to payment that provides financial rewards to individual providers, provider groups, or institutions based on meeting or exceeding established quality or process of care measures.[83] Process of care measures address how clinical care is delivered based on guidelines for standard methods of care, such as prescribing aspirin following a heart attack upon hospital admission.[84] Nationally, research indicates that P4P programs generally reward processes rather than outcomes, and offer financial incentives that are too small to significantly change provider behavior.[85]

In Massachusetts, about half of both large and small health insurers use payment methods to encourage better quality or lower cost care in at least one of their largest products (PPO, HMO, Medicare, or Medicaid) (Table E).

Table E: Larger Health Insurers are More Likely to Use Selected Innovative Payment Methods Relative to Smaller Health Insurers (N=13 health insurers total)

	Small Carriers (N=7)	Large Carriers (N=6)
Payment incentives to encourage primary care	3	3
Episode-based or bundled payments	2	1
Payment for "medical home" services	0	2
P4P for inpatient hospital payments	0	3
P4P for outpatient hospital payments	0	3
P4P for intermediate entities	0	2

Source: Mathematica Policy Research analysis of a survey of thirteen Massachusetts health insurance carriers conducted for the Division of Health Care Finance and Policy, 2009.

- Relatively few health insurers (2 out of 13) pay for "medical home" services in their largest commercial or public products. However, nearly half of all health insurers use other payment incentives to encourage and enhance the delivery of primary care services.

- About half of large health insurers used incentive payments to hospitals and/or intermediate entities in at least one product, but none of the small health insurers did. Most large health insurers tied these payments to process-of-care quality measures, although some large health insurers paid hospitals based on patient safety measures (data not shown).

Conclusion

This report explored the factors that contribute to high health care costs in Massachusetts, including the structure of the health care system and the payment methods currently used by Massachusetts health insurers. Understanding these factors will better prepare the Commonwealth to evaluate and develop reforms that have the potential to simultaneously contain costs and improve quality.

As this report highlights, there are particular areas of opportunity for cost mitigation that the Commonwealth should consider in both the short and longer term:

- There is considerable opportunity in Massachusetts for greater integration of care to achieve improved efficiency and higher quality. The predominance of the fee-for-service payment methodology in both HMOs and PPOs creates limited incentives to ensure effectiveness, coordination, or value of provided services. A small number of providers are currently paid through risk-sharing arrangements. By bundling payments for both primary care physicians and for episodes of care, providers are encouraged to increase their coordination and communication with each other. Those delivery systems that choose to employ global payment or similar risk-sharing and coordinated payment strategies should be rewarded for such efforts.
- Health plans with open networks dominate the Massachusetts insurance landscape. These arrangements allow providers to have more leverage in negotiating payment rates. At present, Massachusetts has few insurance products that limit and coordinate choice of providers, in part because the market demands widespread access to providers. The growing use in Massachusetts of high cost providers for care, a result of open networks, has contributed to higher costs of care. In order for more selective and coordinated markets to be successful, employers as well as employees should understand the value of receiving care at less expensive but equally capable providers, and the long-term consequences to their economic well-being if health care costs are not brought under control.
- Massachusetts' residents now experience lower cost-sharing than their counterparts in the rest of the country. This suggests that there may be an opportunity to develop benefit plans and products that carefully utilize a balanced cost-sharing approach designed to encourage consumer awareness of health care prices and how their decisions may impact health care costs, without burdening consumers or employers. As such, greater transparency and consumer education in provider pricing and quality is needed so that patients can best interpret such data accordingly and make more informed decisions.
- Massachusetts has higher spending than the nation for outpatient hospital care. These facilities provide a wide range of services that can be delivered in physician offices. The growing number of these facilities and increasing range of services provided in hospital outpatient settings suggest that incentives need to be aligned to encourage the right care in the right place at a lower cost.

- Physicians play a major role in determining what services are provided and where. They are choosing to provide more care in outpatient hospital settings, ranging from evaluation and management to imaging and procedures. Because physicians incur staff and equipment costs as well as administrative burden when care is provided in their offices, physicians may have a financial incentive to provide care in these higher-cost facilities. There is opportunity to re-balance payments so that more professional services will be provided in less expensive settings, such as physician offices in community-based settings.
- Over the past decade, the footprint of major academic medical centers in Massachusetts has increased both in terms of the geographic area served and scope of services provided. In recent years, the Commonwealth has taken a number of significant steps to place controls on unnecessary expansion. Support for these and additional regulatory mechanisms are necessary to limit duplictive and overlapping services. Maintaining our national leadership position in health care research requires the state's teaching institutions to remain strong. However, the increasing share of patient care services provided in academic medical centers is a considerable cost driver and provides an opportunity for cost savings.

A comprehensive cost containment program must encourage the development of health systems that deliver coordinated, efficient and high quality care to their patients across the Commonwealth and must take steps to address the market irregularities and imbalances that exist today. Developing the overall market conditions for providers and health insurers to compete on the basis of cost and quality—not utilization—will require action by employers, consumers and government, as well as a careful transition to a health care delivery system that aligns financial incentives with better health care outcomes.

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For the purposes of this report, "economic impact" includes both the direct and indirect business volume generated by an institution. Direct impact includes items such as institutional spending, employee spending, and spending by patients and visitors outside of AAMC-member institutions. Spending by patients and visitors at AAMC-member institutions is not included in the impacts listed in this report. The indirect impact, also known as the multiplier effect, results from the re-spending of dollars generated directly by the institution.

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Health maintenance organizations (HMOs) use a network of health care providers and do not cover care provided outside of the network.

Preferred provider organizations (PPOs) provide incentives for members to use network providers, but members are covered for care received outside the network.

Point of service (POS) plans use a network of providers and require participants to get a referral from a primary care physician (gatekeeper) before using specialists or hospital services; a lower level of coverage is provided for care received outside the network.

A consumer-directed health plan (CDHP) is a medical benefit design in which employees use spending accounts to purchase routine health care services directly. Non-routine expenses are covered by traditional insurance after members meet a generally high deductible. These plans are often combined with Health Savings Accounts (HSAs) or Health Reimbursement Arrangements (HRAs).

A Traditional indemnity plan is a medical benefit design in which the individual pays a premium to the insurer, the individual pays the provider for services rendered, and the insurer reimburses the individual.

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[79] When referring to specific product types (e.g. commercial HMO or PPO products), results are based on health insurers' responses about the largest product offered. Health insurers are classified as large or small in the PPO and HMO markets separately (e.g., a health insurer might be classified as large in the PPO market but small in the HMO market). The four health insurers with the largest PPO enrollment in December 2008 (including both self- and fully-insured members) represented 90 percent of total PPO enrollment; these health insurers are included in the "large PPO health insurers" category. Similarly, the five health insurers with the largest HMO enrollment in 2008 represented 90 percent of total HMO enrollment and are included in the "large HMO health insurers" category. All other health insurers are included in the "small PPO health insurers" and "small HMO health insurers" categories, respectively.

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Appendix: Method for Adjusting CMS State per Capita Health Spending Estimate

Adjustment for Non-Patient Expenditures

- CMS state and national health spending estimates for hospitals are based on total hospital revenue reported by the AHA annual survey. We adjusted the CMS data for hospital spending by subtracting non-patient revenue reported on the survey. Therefore the adjusted hospital spending estimates reflect revenue from patient care services but not research, investment income, or other non-patient care activities.

Adjustment for Area Wage Differences

- For hospitals, nursing homes, and home health care the adjustment was based on the 2006 Medicare geographic wage index (reflecting 2004 data). We calculated a discharge-weighed average statewide wage index for Massachusetts and applied it to the labor portion of spending for each provider (50% for hospitals, 70% for nursing homes, 75% for home health agencies). We estimated the hospital percentage based on AHA survey data which is lower than Medicare's statutory labor percentage for payment - resulting in a smaller adjustment. The labor percentage for nursing home and home health is based on Medicare's statutory percentage.
- For physicians, dentists, and other professionals the adjustment is based on Medicare's geographic adjustment factor (GAF) for physician services based on its geographic practice cost index (GPCI). The index reflects geographic differences in physician work, practice expenses, and malpractice costs. We calculated a population-weighted statewide average index based on the GAF for Boston and for the rest of Massachusetts. We applied the index to 100 percent of applicable expenditures.
- For drugs, durable medical equipment, and other expenditures we did not make any wage adjustement.

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Website: www.mass.gov/dhcfp

Publication Number: 10-43-HCF-01
Authorized by Ellen Bickelman, State Purchasing Agent

Printed on Recycled Paper